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(71) Applicant  
Derek Smith,  
10 High View Road, Douglas, Isle of Man

(72) Inventor  
Frank Gourley Thompson

(74) Agent and/or Address for Service  
William Jones, Willow Lane House, Willow Lane,  
Norwich NR2 1EU

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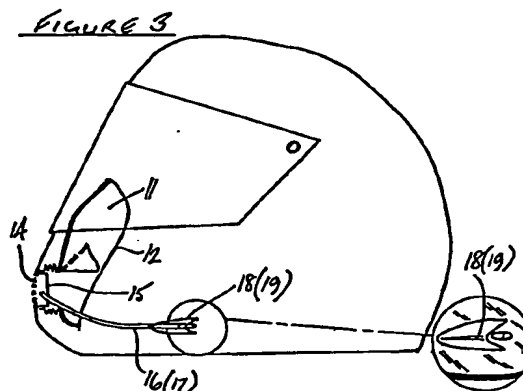
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## (54) Ventilated safety helmet

(57) A full-face visored safety helmet includes a mask (11) which is attached to the chin guard of the helmet to divide off the space within the helmet into upper and lower regions. There are ducts (16, 17) leading from the lower region to vents (18, 19) at respective opposite side regions of the helmet to vent exhaled air to atmosphere.



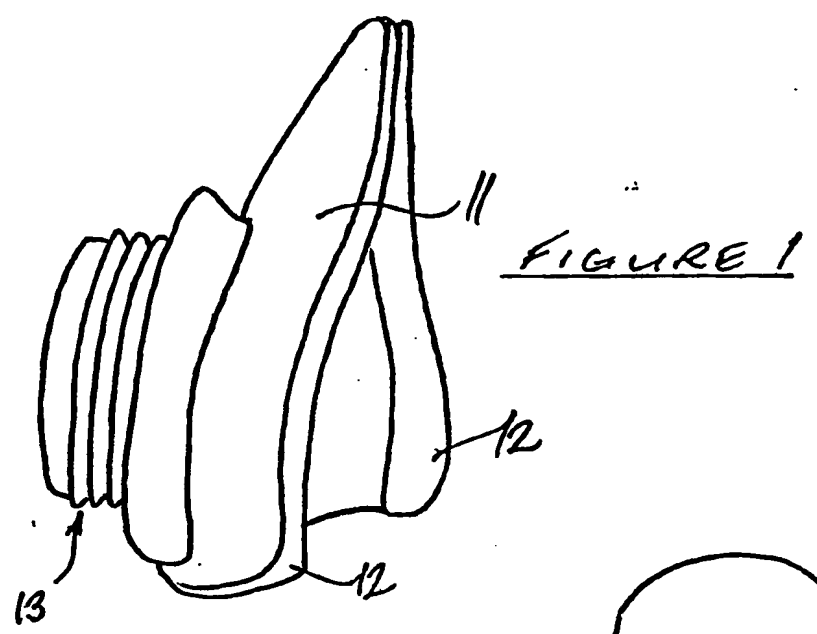


FIGURE 1

FIGURE 2

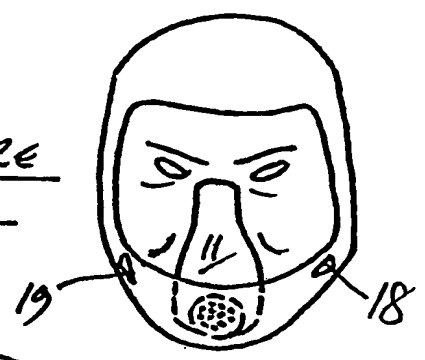
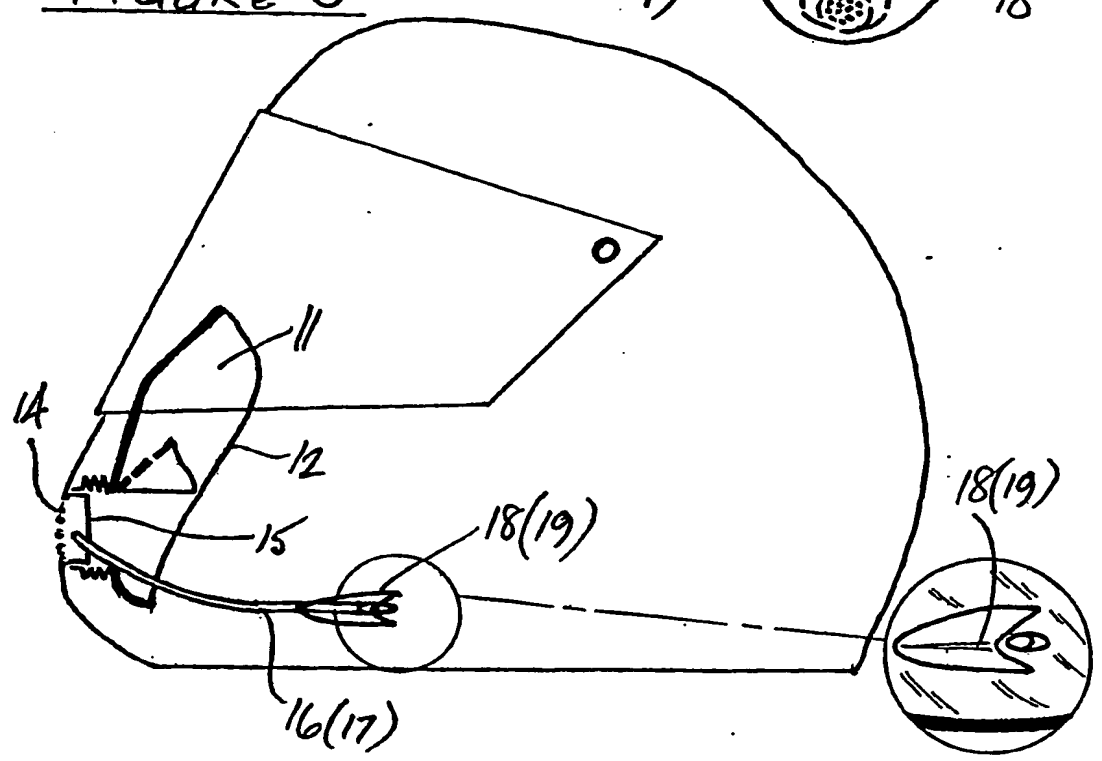


FIGURE 3



## SPECIFICATION

## Ventilated safety helmet

5 *Background to the invention*

The invention relates to full-face safety helmets.

The reader is directed to the specifications of my two previously filed UK Patent Applications No 85 29337 (filed 28th November 1985) and 86 02960 (filed 6th February 1986) both entitled VENTILATED SAFETY HELMET which define the term "full-face safety helmet", discuss the relevant prior art known to me, and disclose helmets with which the present invention is intended and adapted to be used.

15 *Summary of the invention*

According to the invention a full-face visored safety helmet incorporates, in use, a mask attached to the chin guard inside the helmet so as to divide off,

20 in use, the space within the helmet into two regions, a first region below the mask and including the helmet wearer's mouth and nostrils, and a second region above the mask; the mask, in use, engages the wearer's face and the face-engaging periphery of the mask preferably extends for a substantial distance up the wearer's nose towards or as far as the bridge of his nose and follows the opposite sides of the nose without substantially extending to the wearer's cheek regions; there are ducts leading from the bottom region of the mask (i.e. the region around the wearer's mouth) whose primary purpose is to duct air exhaled from the wearer's mouth and nostrils; and the ducts vent such exhaled air to atmosphere from respectively opposite side regions of the helmet.

35 Thus a helmet fitted with such a mask does not rely primarily on the exhaled air from the helmet wearer's mouth being carried out of the helmet into the surrounding atmosphere via the open-to-atmosphere bottom region of the helmet. Neither does it necessarily need an air outlet in the front of the chin guard region of the helmet. Instead, the above-mentioned ducts take the exhaled air round to the sides of the helmet where, in use, the slipstream of air over the helmet will tend to entrain the air from the vents. The effect is to provide an efficient system of taking out of the helmet the relatively warm air from the wearer's mouth and nostrils, and hence minimising the risk of the inside surface of the helmet visor misting over.

50 Preferably a helmet having the features summarising the invention also incorporates an appropriate combination of the inventive features from each of my two previous pending UK patent applications referred to above. The ventilating efficiency of the helmet will then be maximised.

Advantageously, in a case such as that just outlined - specifically, where the helmet chin guard is perforated and incorporates means to duct air, entering the helmet through the perforations, to the base region of the inside of the visor and/or to the wearer's mouth - then the mask which is an essential feature of the present invention fits over an appropriate projection or array of projections (for example, a plenum chamber protruding from the in-

side of the chin guard) and is concertinaed or otherwise readily deformable in the fitted over-region so that it can engage the wearer's face closely whilst accommodating any relatively restricted movements of his head inside the helmet (or, of course, can readily accommodate different helmet wearers having different facial structures).

*Brief description of the drawings*

75 In the accompanying drawings:

*Figure 1* shows a helmet mask in perspective and when viewed from the rear and one side;

*Figure 2* shows diagrammatically the line of the periphery of the mask, in use, against the helmet wearer's face; and

*Figure 3* shows diagrammatically the mask in use in conjunction with associated ducts and vents in a full-face visored safety helmet.

85 *Description of the preferred embodiment*

A face mask 11 (*Figure 1*) is made of rubber or other appropriate material, may be slightly padded and/or covered in fabric, and has its back periphery (the periphery which in use will engage the wearer's face) rolled and padded as indicated at 12.

90 *Figure 1* shows the overall shape of the helmet mask 11. *Figure 2* shows the way in which the back periphery 12 of the mask engages closely the wearer's face in use. *Figure 3* shows the mask in position, fixed to the inside of the chin guard of an appropriate helmet, and a study of *Figures 1* and *3* will confirm that an appropriately concertinaed circular-cylindrical section 13 of the mask 11 fits over the periphery of a plenum chamber 14 protruding from the inside of the chin guard, to locate the mask within the helmet.

The plenum chamber 14 is similar to the chamber 21 described and illustrated in my previous UK patent applications already referred to, and to which the reader has already been specifically directed. The central region of the chin guard of the helmet now illustrated is perforated, again as described in my previous application(s), to admit air which is then piped to the base of the visor of the helmet. In the embodiment now described and illustrated, the plenum chamber 14 does not admit air directly to the helmet wearer's mouth. Such air is drawn from the atmosphere via the open bottom region of the helmet.

115 The chamber 14 is, however, appropriately perforated over its back face 15 and incorporates a one-way valve of known kind, so that the helmet wearer can breathe air into the chamber 14.

Air breathed into the chamber in this way is ducted via respective pipes 16, 17 submerged in the side-padding of the helmet internally, to vents 18, 19. The form of the vents is clearly shown in *Figure 3*. They project from respective opposite sides of the helmet and they are effectively streamlined.

125 A second mask projects from the inside of the chin guard of this particular helmet, in a manner similar to the mask 28 of my previous Application 86 02960 and operates in conjunction with the present mask 11 to duct air from the helmet wearer's nostrils down into the region of his mouth beneath the two masks. Such

air will then tend primarily to be expelled into the plenum chamber 14 whenever the wearer breathes out (although a certain amount of it could of course be drawn direct into the atmosphere via the open bottom region of the helmet). In use, the slipstream of air over the helmet will tend to entrain air from the chamber 14 via the ducts 16, 17 out through the exhaust vents 18, 19.

## 10 CLAIMS

1. A full-face visored safety helmet which incorporates a mask attached to the chin guard inside the helmet so as to divide off, in use, the space within the helmet into two regions, a first region below the mask and including the helmetwearer's mouth and nostrils, and a second region above the mask; the mask, in use, engaging the wearer's face and ducts being provided leading from said first region whose primary purpose is to duct air exhaled from the wearer's mouth and nostrils to atmosphere from respective opposite side regions of the helmet.
2. A helmet according to Claim 1, wherein, in use, the face-engaging periphery of the mask extends for a substantial distance of the wearer's nose towards or as far as the bridge of his nose.
3. A helmet according to Claim 2, wherein, in use, the periphery of the mask follows the opposite sides of the wearer's nose without substantially extending to the wearer's cheek regions.
4. A helmet according to Claim 1, wherein the helmet chin guard is perforated and incorporates means to duct air, entering the helmet through the perforations, to the base region of the inside of the visor and/or to the wearer's mouth.
5. A helmet according to Claim 4, wherein the mask fits over a projection or array of projections in the chin guard.
6. A helmet according to Claim 5, wherein the portion of the mask which fits over the projection or projections is concertinaed or otherwise readily deformable.
7. A full-face visored safety helmet which incorporates a mask and duct means arranged to function substantially as hereinbefore described with reference to and as shown in the accompanying drawings.